

# MACHINE DESIGN

# 1956 ANNUAL INDEX

## Volume 28—January to December

### Author Index

#### A

- Albin, A. L. and H. M. Sachs—"Radio Interference Reduction," Sept. 6, p. 124  
 Alger, P. L. and Y. H. Ku—"Controlling Induction Motors," Nov. 29, p. 142  
 Altman, J. W. and J. D. Folley Jr.  
     "Designing Electronic Equipment"  
     Part 1, June 14, p. 94  
     Part 2—Units, Assemblies and Subassemblies," June 28, p. 70  
     Part 3—Design of Covers and Cases," July 12, p. 94  
     Part 4—Wiring, Cables and Connectors," July 26, p. 92  
     Part 5—Maintenance Accesses," Aug. 9, p. 99  
     Part 6—Test Points," Sept. 6, p. 115  
     Part 7—Maintenance Controls," Sept. 20, p. 109  
     Part 8—Displays," Oct. 4, p. 96  
     Part 9—Installation," Oct. 18, p. 135  
     Part 10—Maintenance Auxiliaries," Nov. 15, p. 111  
     Part 11—Maintenance Procedures," Dec. 13, p. 124  
     Part 12—Maintenance Information and Instructions," Dec. 27, p. 86  
 Alvord, H. H. and K. W. Hall  
     "Testing Gears," July 26, p. 95  
     "Nylon Plastic Gears," Sept. 6, p. 120  
 Alvord, Herbert H.—"Sliding Gears," Jan. 26, p. 69  
 Amber, G. H. and H. R. Carrier—"Packaging the Engineer," Sept. 6, p. 72  
 Angel, Richard T.—"Cold Roll Forming," Dec. 13, p. 106  
 Appleby, E. C.—"Principal Stress," May 17, p. 103  
 Appleton, C. T.—"Thread and Form Rolling," Jan. 26, p. 101  
 Arnold, John E.  
     "Personal Development—an individual approach," Jan. 12, p. 95  
     "Creative Potential," May 3, p. 119  
 Auman, Reiner J.—"Brake Design," June 14, p. 135

#### B

- Bachelor, A. T. and C. G. Helmick  
     "Adjustable-Frequency AC Drives," Sept. 20, p. 145  
     "Adjustable-Frequency Drives," Oct. 18, p. 142  
 Baker, W. W.—"Digital and Analog Computers," Feb. 9, p. 134  
 Ballou, Richard P.—"Applying the Torque Motor," Jan. 12, p. 143  
 Barriage, J. B. and A. J. Durelli—"Pressurized Square Tubing," Mar. 8, p. 115  
 Baxter, A. N.—"Using Dictation Equipment," Dec. 13, p. 94  
 Bayer, Lad J.—"Controlling Manufacturing Costs," Aug. 9, p. 119  
 Beckim, Russell W.—"Closure Seals," Sept. 6, p. 97

- Begg, Stuart and Walton Yerger—"Tapping Screws for Plastics," June 28, p. 97  
 Benson, Arne  
     "Gear Ratios," Feb. 23, p. 103  
     "Gear Ratios," Mar. 8, p. 108  
 Black, W. R.—"Molded Plastic Fasteners," Sept. 20, p. 121  
 Blomquist, R. F.—"High-Strength Adhesives," May 31, p. 99  
 Blye, Harold—"Merit Evaluation System," May 31, p. 78  
 Bobco, R. P., A. L. Gosman and F. R. Campbell—"Column Design," Dec. 13, p. 137  
 Bock, W. K.—"Why Specify Ductility?" Jan. 12, p. 133  
 Bogardus, F. J.—"Intermittent-Motion Mechanisms," Sept. 20, p. 124  
 Botsiber, D. W. and L. Kingston—"Cycloid Speed Reducer," June 28, p. 65  
 Braley, S. A., Jr.—"Silicone Rubber," Oct. 4, p. 123  
 Breedon, D. B.—"Analog and Digital Computers," Dec. 13, p. 140  
 Briggs, C. W., E. B. Evans and L. J. Ebert—"Cast and Wrought Steels," Nov. 15, p. 128  
 Bright, R. L.—"Silicon Rectifiers," May 17, p. 110  
 Brown, Russell V.—"Numbering Systems," May 17, p. 106  
 Brueggeman, L. T.—"V-Belt Drive Bearing Loads," Mar. 22, p. 137  
 Buchanan, T. C.—"Small Rivets," Aug. 23, p. 96  
 Burwell, Stanley J.—"Drafting Short Cuts," Aug. 9, p. 83

#### C

- Campbell, F. R., A. L. Gosman and R. P. Bobco—"Column Design," Dec. 13, p. 137  
 Candee, Allan H.—"Involute Gear Teeth," May 17, p. 90  
 Carrier, H. R. and G. H. Amber—"Packaging the Engineer," Sept. 6, p. 72  
 Cason, Durward—"Tapered Cantilever Beams," Nov. 1, p. 113  
 Cattabiani, Eugene J.—"Pivoted-Shoe Radial Bearings," Dec. 27, p. 63  
 Charron, G., G. Dewey and V. Paquet—"Large Perspectives Simplified," Dec. 13, p. 102  
 Cheney, A. J.  
     "Designing with Nylon"  
     Part 1, Feb. 23, p. 95  
     Part 2, Mar. 8, p. 95  
 Cheney, A. J., W. B. Happoldt and K. G. Swayne—"Designing Plastic Bearings," June 14, p. 143  
 Clark, C. L.—"Materials for High Temperatures," May 31, p. 95  
 Clements, B. B.—"Bolted Flange Joints," Nov. 15, p. 119  
 Cohn, Charles C.—"Plating Metal-Powder Parts," Mar. 8, p. 113  
 Corten, H. T., G. M. Sinclair and T. J. Dolan—"Titanium Alloys," Apr. 5, p. 134  
 Covner, Bernard J.—"Job-Performance Interviews," Nov. 15, p. 76  
 Cowie, Alexander—"Stepped and Tapered Shafts," Aug. 9, p. 111  
 Cram, W. D.—"Cam Design," Nov. 1, p. 92  
 Crocker, W. S. and H. H. P. Lemmerman—"Fusion-Temperature Controls," Dec. 13, p. 115

## D

- Denavit, J. and R. S. Hartenberg  
"Men and Machines," May 3, p. 74; June 14, p. 101;  
July 12, p. 84  
"Kinematic Synthesis," Sept. 6, p. 101  
Dewey, G., V. Paquet and G. Charron—"Large Perspectives Simplified," Dec. 13, p. 102  
DiTirro, D. A.—"All-Pneumatic Control Circuit," Mar. 22, p. 120  
Dix, E. M., Kronenberg and P. Maker—"Controlling Vibration," July 12, p. 103  
Dochat, E. G. and T. Mariner—"Flexural Damping Materials," Apr. 19, p. 119  
Dolan, T. J., G. M. Sinclair and H. T. Corten—"Titanium Alloys," Apr. 5, p. 134  
Drescher, E. W.—"Miniature Screws," Aug. 23, p. 139  
DuBois, W. H.—"Metal-Ceramic Friction Materials," Nov. 29, p. 139  
Dudnick, Sol—"Geneva Mechanisms," Dec. 27, p. 91  
Durell, A. J. and J. B. Barriage—"Pressurized Square Tubing," Mar. 8, p. 115  
Durham, Harold M.—"Involute Gear Tooth Layout," May 3, p. 117

## E

- Elbert, L. J., E. B. Evans and C. W. Briggs—"Cast and Wrought Steels," Nov. 15, p. 128  
Evans, E. B., L. J. Elbert and C. W. Briggs—"Cast and Wrought Steels," Nov. 15, p. 128

## F

- Fangemann, M. Gerard—"Spring Alloys," May 31, p. 121  
Farnsworth, G. B. and S. P. Jackson—"Germanium Power Rectifiers," Jan. 26, p. 71  
Favre, A. E.—"Designing Aluminum Forgings," Jan. 26, p. 76  
Ferrari, E. and R. H. Koepf—"Prototype Appearance Models," Mar. 8, p. 118  
Fogiel, Max—"Selecting Gear Ratio with Limit Stops," Nov. 1, p. 108  
Folley, J. D. Jr. and J. W. Altman  
"Designing Electronic Equipment"  
Part 1—"June 14, p. 94  
Part 2—Units, Assemblies and Subassemblies," June 28, p. 70  
Part 3—Design of Covers and Cases," July 12, p. 94  
Part 4—Wiring, Cables and Connectors," July 26, p. 92  
Part 5—Maintenance Accesses," Aug. 9, p. 99  
Part 6—Test Points," Sept. 6, p. 115  
Part 7—Maintenance Controls," Sept. 20, p. 109  
Part 8—Displays," Oct. 4, p. 96  
Part 9—Installation," Oct. 18, p. 135  
Part 10—Maintenance Auxiliaries," Nov. 15, p. 111  
Part 11—Maintenance Procedures," Dec. 13, p. 124  
Part 12—Maintenance Information and Instructions," Dec. 27, p. 86  
Fortini, Earlwood T.  
"Dimension Control in Design"  
Part 1—Fundamentals: Precision and Accuracy," Apr. 5, p. 82  
Part 2—Tolerance Zones; Related Dimensions," Apr. 19, p. 112  
Part 3—Limit Dimensioning Methods for Analyzing Mechanism Trains," May 3, p. 92  
Part 4—Limit Dimensioning Methods for Determining Tolerances," May 17, p. 79  
Part 5—Probability Dimensioning Methods for Analyzing Mechanism Trains," June 14, p. 113  
Part 6—Probability Dimensioning Methods for Determining Tolerances," June 28, p. 82  
Part 7—Practical Considerations in Applying Dimension Control Methods," July 12, p. 110  
Fosburg, P. L.—"Hydraulic Torque Converters," Apr. 5, p. 126  
Francis, Howard T.—"Corrosion-Resistant Structural Materials," May 31, p. 104  
Frost, P. D.—"Light Alloys," May 31, p. 86  
Fuller, Dudley D.—"Journal Bearings," Feb. 9, p. 119

## G

- Gates, G. H. and W. M. Larson—"Polyurethane Rubber," Sept. 20, p. 150  
Gatwood, E. H.—"Pressure Losses in Hydraulic Lines," Oct. 4, p. 113  
Gebel, I.—"AC Push-Pull Solenoids," July 26, p. 100  
Gerber, Lester—"Filing Engineering Drawings," Dec. 27, p. 93  
Gillespie, C. M.—"Adding Machines as Calculators," Dec. 13, p. 113  
Goetz, Harry C.—"How to Save Drafting Time," Jan. 26, p. 64  
Gosman, A. L., F. R. Campbell and R. P. Bobco—"Column Design," Dec. 13, p. 137  
Gould, Jay R.—"Improving Technical Writing," Apr. 5, p. 111  
Gray, Albert Woodruff  
"Design Patents," Jan. 12, p. 114  
"Protecting Design Ideas," Mar. 8, p. 92  
"Patent Licensing," Apr. 5, p. 90  
"Patent Licenses and Assignments," June 14, p. 129  
"Domestic Patent Applications and Foreign Patents," Oct. 4, p. 85  
"Patents of Combinations," Nov. 15, p. 85  
Greenwald, Frank S.—"Permanent Magnet Rotors," May 3, p. 122  
Greer, Lanier—"Electrical Insulating Materials," May 31, p. 90

## H

- Hall, A. S., H. G. Laughlin and A. R. Holowenko—"Epicyclic Gear Systems," Mar. 22, p. 132; Nov. 29, p. 129  
Hall, K. W. and H. H. Alvord  
"Testing Gears," July 26, p. 95  
"Nylon Plastic Gears," Sept. 6, p. 120  
Hamme, Richard N.—"Acoustical Materials," July 26, p. 68  
Hanau, Heinz—"Ball Bearings for High Speeds," Nov. 15, p. 88  
Hanks, Sydney A.—"Metal-to-Metal Adhesives," Dec. 27, p. 78  
Happoldt, W. B., A. J. Cheney and K. G. Swayne—"Designing Plastic Bearings," June 14, p. 143  
Hartenberg, R. S. and J. Denavit  
"Men and Machines," May 3, p. 74; June 14, p. 101;  
July 12, p. 84  
"Kinematic Synthesis," Sept. 6, p. 101  
Hathaway, Charles A.—"Air Impellers," Oct. 4, p. 88  
Heimann, Heinrich—"Retaining Ring Assemblies," Dec. 27, p. 67  
Helmick, C. G.—"Selecting AC Motors," Apr. 5, p. 106  
Helmick, C. G. and A. T. Bachelier  
"Adjustable-Frequency AC Drives," Sept. 20, p. 145  
"Adjustable-Frequency Drives," Oct. 18, p. 142  
Herchenroeder, L. W.—"Numerical Coding Methods," June 28, p. 100  
Herndon, Walter B.—"Planet Pinions," Mar. 22, p. 142  
Hill, Henry C.—"Small Gas Turbines," Feb. 9, p. 133  
Himelblau, Harry Jr.—"Dynamic Vibration Absorbers," Sept. 20, p. 134  
Hinkle, R. T., Ching-u Ip and I. E. Morse, Jr.—"Rolling Contact Mechanisms," July 26, p. 75  
Hix, C. F. Jr.—"Planned Training—a composite method," Jan. 12, p. 96  
Holowenko, A. R., H. G. Laughlin and A. S. Hall—"Epicyclic Gear Systems," Mar. 22, p. 132; Nov. 29, p. 129  
Howell, Glen H.—"Factors of Safety," July 12, p. 76  
Hrudka, Robert F.—"Vacuum-Formed Plastic Parts," Mar. 22, p. 114  
Huffman, C. J.—"Stepped Aluminum Extrusions," Nov. 1, p. 116  
Humphrey, A. J.—"Electronic Drives," Nov. 15, p. 123  
Huntress, Howard B.  
"Multiple-Disk Clutches and Brakes," Mar. 8, p. 82  
"Friction Brakes and Clutches," Apr. 5, p. 113

## I, J

- Ip, Ching-u, I. E. Morse Jr. and R. T. Hinkle—"Rolling Contact Mechanisms," July 26, p. 75



- Jackson, S. P. and G. B. Farnsworth—"Germanium Power Rectifiers," Jan. 26, p. 71  
 Johnson, A. Pemberton—"Development Technical Managers," July 26, p. 104  
 Johnson, R. C. and J. W. Sawyer—"Large Plastic Covers," Jan. 12, p. 145  
 Johnson, Ray C.  
   "Cam Mechanisms," Jan. 26, p. 85  
   "Geneva Mechanisms," Mar. 22, p. 107  
   "Controlled Spring Force," June 14, p. 131  
   "Minimizing Cam Vibrations," Aug. 9, p. 103  
   "Cam Profiles," Dec. 13, p. 129

## K

- Kaplan, J., and D. Marshall—"Spring Clutches," Apr. 19, p. 107  
 Keery, R. J.—"Areas of Circle Segments," Sept. 6, p. 119  
 Keller, R. G.—"High-Temperature Hydraulics," Aug. 9, p. 121  
 Kemper, John D.—"Simplifying Engineering Controls," June 28, p. 56  
 Kennicott, W. L.—"Fastening and Joining Carbides," Mar. 22, p. 122  
 Kennison, George F.—"Cycloidal-Motion Cams," Jan. 12, p. 141  
 Kerley, J. J., Jr.—"Vibration Power," Aug. 9, p. 93  
 Kimberly, E. E.—"The Engineer in Court," Aug. 23, p. 90  
 King, William C.—"Felt," Jan. 26, p. 91  
 Kingston, L. and D. W. Botstiber—"Cycloid Speed Reducer," June 28, p. 65  
 Kirkpatrick, James S.—"Drawn Titanium Parts," Aug. 23, p. 153  
 Klat, Karl E.—"Modified Starwheels," Oct. 4, p. 100  
 Knudson, M. E.—"New NEMA Standards," July 12, p. 121  
 Koch, Robert H.—"Packing and Gasket Materials," May 31, p. 117  
 Koenig, J. H. and E. J. Smoke—"Ceramic Materials," Mar. 22, p. 139  
 Koepf, R. H. and E. Ferreri—"Prototype Appearance Models," Mar. 8, p. 118  
 Krause, R. A.—"Rubber," Apr. 19, p. 128  
 Kronenberg, M., P. Maker and E. Dix—"Controlling Vibration," July 12, p. 103  
 Ku, Y. H. and P. L. Alger—"Controlling Induction Motors," Nov. 29, p. 142  
 Kyropoulos, S.—"Oil-Groove Design in Bearings," June 14, p. 119  
 Kugler, A. N.—"Brazed Joints," Feb. 23, p. 116  
 Kyropoulos, S.  
   "Gear Lubrication  
   Part 3," Jan. 12, p. 137

## L

- Lahm, James J.—"Keeping a Technical File," Feb. 9, p. 91  
 Lanier, H. F.—"Large Engineering Projects," Dec. 27, p. 54  
 Larson, W. M. and G. H. Gates—"Polyurethane Rubber," Sept. 20, p. 150  
 Laughlin, H. G., A. R. Holowenko and A. S. Hall—"Epicyclic Gear Systems," Mar. 22, p. 132; Nov. 29, p. 129  
 Lebens, John C.—"Fuses," Mar. 8, p. 77  
 Lemmerman, H. H. P. and W. S. Crocker—"Fusion-Temperature Controls," Dec. 13, p. 115  
 Letner, H. R.—"Residual Stresses," May 17, p. 112  
 Linsky, Chester  
   "Engineering Manpower 'Shortage,'" May 17, p. 62  
   "Training Design Engineers," Oct. 18, p. 92  
 Logan, George H.—"Physical Mechanics," Apr. 5, p. 121  
 Love, J. Jr., and O. A. Pringle—"Designing Bolts," June 28, p. 104  
 Lowe, Howell C.—"Hydraulic Pumps and Motors," July 12, p. 117  
 Lubahn, J. D.—"Applying Notch Tensile Tests," Feb. 23, p. 142  
 Lundquist, Ingemar—"Miniature Mechanical Clutches," Oct. 18, p. 124  
 Lupton, George W., Jr.—"Engineering on Government Contracts," Aug. 9, p. 76

## M

- Mabie, H. H.—"Beam Deflection," Feb. 9, p. 129  
 Macduff, J. N.  
   "Analog Simulators  
   Part 1—Analog Components and Mathematics," Aug. 9, p. 86  
   Part 2—How to Use the Simulator in Vibration Analysis," Sept. 6, p. 106  
 MacKenzie, Robert V.—"Translating Screw Threads," Nov. 29, p. 106  
 Magnus, Herbert A.—"Pressurized Cylinders," Feb. 23, p. 135  
 Maker, P., M. Kronenberg and E. Dix—"Controlling Vibration," July 12, p. 103  
 Mariner, T. and E. G. Dochat—"Flexural Damping Materials," Apr. 19, p. 119  
 Mark, M.—"Mohr's Circles," Jan. 12, p. 119  
 Marsh, Robert T.—"Simplified Report Writing," Jan. 26, p. 90  
 Marshall, D. and J. Kaplan—"Spring Clutches," Apr. 19, p. 107  
 Marshall, Donald—"Cantilever Beams," Jan. 26, p. 97  
 Martin, Louis D.—"Face-Gear Geometry," Oct. 4, p. 106  
 Marvin, Philip R.  
   "Successful Product Development," Jan. 26, p. 56  
   "Picking Profitable Products," Feb. 9, p. 80  
   "The Engineer's Problem," Mar. 8, p. 70  
   "Engineering Management," Sept. 20, p. 94  
   "Evaluating Engineering Operations," Nov. 1, p. 74  
   "Engineering Organization," Nov. 20, p. 82  
 Mathues, Thomas O.—"Extruded Rubber," July 12, p. 126  
 Matthew, Morton P.—"Cardboard Mock-ups and Models," Oct. 4, p. 76  
 Mayers, H. R.—"Inventions in the Courts," June 14, p. 154  
 McNabb, Warren—"Generating Gear Root Fillets," Sept. 20, p. 105  
 Merz, Kenneth A.—"Air-Circuit Design," June 28, p. 88  
 Meyer, Raymond—"Flanged Connections," Nov. 1, p. 109  
 Mezoff, John G. and Peder E. Moluf—"Magnesium Castings," May 17, p. 101  
 Middleton, Marshall Jr.—"Digital Computers in Design," Feb. 23, p. 88  
 Miles, L. D.—"Product Improvement," Oct. 18, p. 148  
 Mohler, J. B.  
   "Sleeve Bearing Materials," May 3, p. 105  
   "Sleeve Bearing Materials," May 31, p. 108  
   "Soldered Joints," June 14, p. 123  
   "Oil Grooves for Sleeve Bearings," July 12, p. 99  
 Moluf, Peder E. and John G. Mezoff—"Magnesium Castings," May 17, p. 101  
 Moritz, J. M. and H. L. Stewart—"Making Hydraulic Circuits Safe," Nov. 15, p. 107  
 Morse, I. E., Jr., Ching-u Ip and R. T. Hinkle—"Rolling-Contact Mechanisms," July 26, p. 75  
 Moyer, Harris P.—"Preforming and Welding," Apr. 19, p. 148

## N

- Neidhart, John J.—"Lighting an Engineering Department," Mar. 22, p. 88  
 Nightingale, J. M.  
   "Automatic Control Systems," May 17, p. 70  
   "Servo Mathematics," June 28, p. 74  
   "Evaluating Servo System Performance  
   Part 1," July 26, p. 78  
   Part 2," Aug. 9, p. 106  
   "Analyzing Servo Systems," Nov. 1, p. 87  
   "Hydraulic Servo Components  
   Part 1," Nov. 29, p. 114  
   Part 2," Dec. 13, p. 133  
   Part 3," Dec. 27, p. 73  
 Norton, J. T.—"Selecting Cermets," Apr. 19, p. 143

## P

- Paquet, V., G. Dewey and G. Charron—"Large Perspectives Simplified," Dec. 13, p. 102  
 Paret, Richard—"Using Stainless Steels," Oct. 18, p. 114





- Jackson, S. P. and G. B. Farnsworth—"Germanium Power Rectifiers," Jan. 26, p. 71  
 Johnson, A. Pemberton—"Development Technical Managers," July 26, p. 104  
 Johnson, R. C. and J. W. Sawyer—"Large Plastic Covers," Jan. 12, p. 145  
 Johnson, Ray C.  
   "Cam Mechanisms," Jan. 26, p. 85  
   "Geneva Mechanisms," Mar. 22, p. 107  
   "Controlled Spring Force," June 14, p. 131  
   "Minimizing Cam Vibrations," Aug. 9, p. 103  
   "Cam Profiles," Dec. 13, p. 129

## K

- Kaplan, J. and D. Marshall—"Spring Clutches," Apr. 19, p. 107  
 Keery, R. J.—"Areas of Circle Segments," Sept. 6, p. 119  
 Keller, R. G.—"High-Temperature Hydraulics," Aug. 9, p. 121  
 Kemper, John D.—"Simplifying Engineering Controls," June 28, p. 56  
 Kennicott, W. L.—"Fastening and Joining Carbides," Mar. 22, p. 122  
 Kennison, George F.—"Cycloidal-Motion Cams," Jan. 12, p. 141  
 Kerley, J. J., Jr.—"Vibration Power," Aug. 9, p. 93  
 Kimberly, E. E.—"The Engineer in Court," Aug. 23, p. 90  
 King, William C.—"Felt," Jan. 26, p. 91  
 Kingston, L. and D. W. Botstiber—"Cycloid Speed Reducer," June 28, p. 65  
 Kirkpatrick, James S.—"Drawn Titanium Parts," Aug. 23, p. 153  
 Kist, Karl E.—"Modified Starwheels," Oct. 4, p. 100  
 Knudson, M. E.—"New NEMA Standards," July 12, p. 121  
 Koch, Robert H.—"Packing and Gasket Materials," May 31, p. 117  
 Koelg, J. H. and E. J. Smoke—"Ceramic Materials," Mar. 22, p. 139  
 Koepf, R. H. and E. Ferreri—"Prototype Appearance Models," Mar. 8, p. 118  
 Krause, R. A.—"Rubber," Apr. 19, p. 128  
 Kronenberg, M., P. Maker and E. Dix—"Controlling Vibration," July 12, p. 103  
 Ku, Y. H. and P. L. Alger—"Controlling Induction Motors," Nov. 29, p. 142  
 Kyropoulos, S.—"Oil-Groove Design in Bearings," June 14, p. 119  
 Kugler, A. N.—"Brazed Joints," Feb. 23, p. 116  
 Kyropoulos, S.  
   "Gear Lubrication  
   Part 3," Jan. 12, p. 137

## L

- Lahm, James J.—"Keeping a Technical File," Feb. 9, p. 91  
 Lanier, H. F.—"Large Engineering Projects," Dec. 27, p. 54  
 Larson, W. M. and G. H. Gates—"Polyurethane Rubber," Sept. 20, p. 150  
 Laughlin, H. G., A. R. Holowenko and A. S. Hall—"Epicyclic Gear Systems," Mar. 22, p. 132; Nov. 29, p. 129  
 Lebens, John C.—"Fuses," Mar. 8, p. 77  
 Lemmerman, H. H. P. and W. S. Crocker—"Fusion-Temperature Controls," Dec. 13, p. 115  
 Letner, H. R.—"Residual Stresses," May 17, p. 112  
 Linsky, Chester  
   "Engineering Manpower 'Shortage,'" May 17, p. 62  
   "Training Design Engineers," Oct. 18, p. 92  
 Logan, George H.—"Physical Mechanics," Apr. 5, p. 121  
 Love, J. Jr., and O. A. Pringle—"Designing Bolts," June 28, p. 104  
 Lowe, Howell C.—"Hydraulic Pumps and Motors," July 12, p. 117  
 Lubahn, J. D.—"Applying Notch Tensile Tests," Feb. 23, p. 142  
 Lundquist, Ingemar—"Miniature Mechanical Clutches," Oct. 18, p. 124  
 Lupton, George W., Jr.—"Engineering on Government Contracts," Aug. 9, p. 76

## M

- Mable, H. H.—"Beam Deflection," Feb. 9, p. 129  
 Macduff, J. N.  
   "Analog Simulators  
   Part 1—Analog Components and Mathematics," Aug. 9, p. 86  
   Part 2—How to Use the Simulator in Vibration Analysis," Sept. 6, p. 106  
 MacKenzie, Robert V.—"Translating Screw Threads," Nov. 29, p. 106  
 Magnus, Herbert A.—"Pressurized Cylinders," Feb. 23, p. 135  
 Maker, P., M. Kronenberg and E. Dix—"Controlling Vibration," July 12, p. 103  
 Mariner, T. and E. G. Dochat—"Flexural Damping Materials," Apr. 19, p. 119  
 Mark, M.—"Mohr's Circles," Jan. 12, p. 119  
 Marsh, Robert T.—"Simplified Report Writing," Jan. 26, p. 90  
 Marshall, D. and J. Kaplan—"Spring Clutches," Apr. 19, p. 107  
 Marshall, Donald—"Cantilever Beams," Jan. 26, p. 97  
 Martin, Louis D.—"Face-Gear Geometry," Oct. 4, p. 106  
 Marvin, Philip R.  
   "Successful Product Development," Jan. 26, p. 56  
   "Picking Profitable Products," Feb. 9, p. 80  
   "The Engineer's Problem," Mar. 8, p. 70  
   "Engineering Management," Sept. 20, p. 94  
   "Evaluating Engineering Operations," Nov. 1, p. 74  
   "Engineering Organization," Nov. 20, p. 82  
 Mathues, Thomas O.—"Extruded Rubber," July 12, p. 126  
 Matthew, Morton P.—"Cardboard Mock-ups and Models," Oct. 4, p. 76  
 Mayers, H. R.—"Inventions in the Courts," June 14, p. 154  
 McNabb, Warren—"Generating Gear Root Fillets," Sept. 20, p. 105  
 Merz, Kenneth A.—"Air-Circuit Design," June 28, p. 88  
 Meyer, Raymond—"Flanged Connections," Nov. 1, p. 109  
 Mezoff, John G. and Peder E. Moluf—"Magnesium Castings," May 17, p. 101  
 Middleton, Marshall Jr.—"Digital Computers in Design," Feb. 23, p. 88  
 Miles, L. D.—"Product Improvement," Oct. 18, p. 148  
 Mohler, J. B.  
   "Sleeve Bearing Materials," May 3, p. 105  
   "Sleeve Bearing Materials," May 31, p. 108  
   "Soldered Joints," June 14, p. 123  
   "Oil Grooves for Sleeve Bearings," July 12, p. 99  
 Moluf, Peder E. and John G. Mezoff—"Magnesium Castings," May 17, p. 101  
 Moritz, J. M. and H. L. Stewart—"Making Hydraulic Circuits Safe," Nov. 15, p. 107  
 Morse, I. E., Jr., Ching-u Ip and R. T. Hinkle—"Rolling-Contact Mechanisms," July 26, p. 75  
 Moyer, Harris P.—"Preforming and Welding," Apr. 19, p. 148

## N

- Neidhart, John J.—"Lighting an Engineering Department," Mar. 22, p. 88  
 Nightingale, J. M.  
   "Automatic Control Systems," May 17, p. 70  
   "Servo Mathematics," June 28, p. 74  
   "Evaluating Servo System Performance  
   Part 1," July 26, p. 78  
   Part 2," Aug. 9, p. 106  
   "Analyzing Servo Systems," Nov. 1, p. 87  
   "Hydraulic Servo Components  
   Part 1," Nov. 29, p. 114  
   Part 2," Dec. 13, p. 133  
   Part 3," Dec. 27, p. 73  
 Norton, J. T.—"Selecting Cermets," Apr. 19, p. 143

## P

- Paquet, V., G. Dewey and G. Charron—"Large Perspectives Simplified," Dec. 13, p. 102  
 Paret, Richard—"Using Stainless Steels," Oct. 18, p. 114



- Parish, J. M.—"Selecting Engineering Personnel," Nov. 29, p. 141  
 Pleuthner, Willard—"Brainstorming—a group attack," Jan. 12, p. 92  
 Ponstingl, John C.  
 "Electric-Motor Braking," Jan. 12, p. 103  
 "Static Electric Controls," Nov. 29, p. 89  
 Pringle, O. A. and J. Love Jr.—"Designing Bolts," June 28, p. 104  
 Prior, R. A.—"Voltage Regulators," May 17, p. 85  
 Pulsifer, V. and A. Siede—"Wear Evaluation," Jan. 12, p. 101  
 Pulsifer, Verne—"Materials for Wear Resistance," May 31, p. 126

## R

- Radzimovsky, Eugene I.—"Planetary Gear Drives," Feb. 9, p. 101  
 Ragland, Ben—"Fluid Couplings," May 3, p. 108  
 Rappaport, Sigmund  
 "Cam Profiles," Apr. 5, p. 120  
 "Shearing Moving Webs," May 3, p. 101  
 Riddle, Johnny—"Basic Ball Bearings," Feb. 23, p. 127  
 Rogerson, W. M.—"Aluminum Alloys for Welding," Apr. 19, p. 103  
 Rothbart, Harold A.  
 "Cam Dynamics," Mar. 8, p. 100  
 "Basic Cam Systems," May 31, p. 133  
 "Cam Design," Oct. 18, p. 107  
 Rounds, T. E.  
 "Lubrication Systems for High-Performance Ball Bearings," Sept. 20, p. 114  
 "Selecting Lubricants for High-Performance Ball Bearings," Oct. 18, p. 101

## S

- Sachs, H. M. and A. L. Albin—"Radio Interference Reduction," Sept. 6, p. 124  
 Saelman, B.  
 "Optimum Beam Design," Jan. 12, p. 125  
 "Friction in Mechanisms," Feb. 23, p. 123  
 "Round Tubes in Bending," Sept. 20, p. 141  
 "Rectangular and Elliptical Tubes," Oct. 18, p. 139  
 Saul, John R.—"Specifying Manufacturing Temperatures," Aug. 9, p. 91  
 Sawyer, J. W. and R. C. Johnson—"Large Plastic Covers," Jan. 12, p. 145  
 Schirmer, E. V.—"Designing for Magnesium," Feb. 23, p. 137  
 Scholten, Richard A.—"Magnetic Latches," Dec. 13, p. 146  
 Schwarz, B.—"AC and DC Electric-Motor Drive," Nov. 29, p. 120  
 Shepard, A. P.—"Flame-Sprayed Ceramic Coatings," Dec. 27, p. 96  
 Siede, A. and V. Pulsifer—"Wear Evaluation," Jan. 12, p. 101  
 Sinclair, G. M., H. T. Corten and T. J. Dolan—"Titanium Alloys," Apr. 5, p. 134  
 Smith, Edwin F.—"Helical Compression Springs," Apr. 19, p. 133  
 Smith, W. P.—"Designing and Manufacturing," Aug. 23, p. 158  
 Smoke, E. J. and J. H. Koenig—"Ceramic Materials," Mar. 22, p. 139  
 Smoley, Earl M.—"Gasketed Joints," May 17, p. 76  
 Soled, Julius—"Industrial Fasteners," Aug. 23, p. 105  
 Spotts, M. F.—"Hobbed Spur Gear Teeth," Apr. 19, p. 123  
 Stedfeld, Robert L.—"Earth Satellite," Nov. 1, p. 82  
 Stephens, W. T.—"Hydraulic System Components," Feb. 23, p. 108  
 Stewart, H. L. and J. M. Moritz—"Making Hydraulic Circuits Safe," Nov. 15, p. 107  
 Still, Edwin W.  
 "Library Keys for Engineers," July 26, p. 58  
 "Government Research Reports," Oct. 18, p. 99

- Stone, J. James, Jr.—"Computers for Controls," Oct. 4, p. 119  
 Strasser, Federico  
 "Drawn Parts," Jan. 12, p. 121  
 "Strengthening Metal Stampings," Nov. 1, p. 104  
 Swayne, K. G., A. J. Cheney and W. B. Happpoldt—"Designing Plastic Bearings," June 14, p. 143

## T, U, V

- Tarr, Allan L.—"Metals for Low Temperatures," May 31, p. 111  
 Thielsch, Helmut  
 "Designing Welded Joints for Dissimilar Steels," Apr. 5, p. 97  
 "Welding Composite Steels," May 3, p. 96  
 "Welding Composite Steels," July 26, p. 86  
 Thoen, Richard L.—"Precision Gears," Apr. 5, p. 93  
 Titchener, Paul F.—"Designing Wire Parts," Feb. 9, p. 111  
 Unholtz, Karl—"Vibration Test Specifications," Mar. 22, p. 100  
 Unverzagt, P. A.—"Blind Tapped Holes," July 26, p. 99  
 Veinott, C. G.—"Selecting Electric Motors," May 31, p. 140  
 Von Pechy, T. Thomas—"When to Commercialize Inventions," Sept. 20, p. 100

## W, Y

- Wagner, David E.—"Self-Sealing Fasteners," Aug. 23, p. 145  
 Wallenbrock, Ralph E.  
 "Fastening and Joining Plastic Parts," Feb. 9, p. 94  
 "Molded Plastic Parts," May 3, p. 85  
 Waltermire, William G.—"Interference-Fit Thread," Sept. 6, p. 83  
 Waterhouse, R. B.—"Fretting Corrosion," Jan. 26, p. 104  
 Weber, Theodore Jr.—"Cam Development by Evolute Analysis," Feb. 9, p. 117  
 Werley, G. L.—"Brass-Powder Parts," Jan. 26, p. 108  
 Willis, E. J.—"Magnesium Plaster-Mold Castings," Feb. 9, p. 131  
 Woolridge, Dean E.—"Systems Engineering," Nov. 1, p. 120  
 Yerger, Walton and Stuart Begg—"Tapping Screws for Plastics," June 28, p. 97  
 Yerger, Walton R.—"Fastener Finishes," Aug. 23, p. 149

## Subject Index

## A

- Accelerometers, May 17, p. 144; May 31, p. 176; Aug. 23, p. 212; Oct. 18, p. 197; Dec. 27, p. 113  
 Acoustical materials, July 26, p. 68  
 Actuator, linear, Feb. 9, p. 156  
 Actuators, Aug. 9, p. 170; Aug. 23, p. 5; Sept. 6, p. 8, 81, 180; Sept. 20, p. 200; Oct. 18, p. 238; Oct. 18, p. 139, 148; Nov. 15, p. 192; Nov. 29, p. 106, 182; Dec. 13, p. 100  
 Adding machines as calculators, Dec. 13, p. 113  
 Adhesives, Feb. 9, p. 145; May 3, p. 6; May 31, p. 99; Aug. 23, p. 206; Oct. 4, p. 150; Nov. 15, p. 171; Dec. 27, p. 108  
 for materials handling, Nov. 29, p. 88  
 metal-to-metal, Dec. 27, p. 78  
 Air circuits, June 28, p. 85  
 Air conditioning, Mar. 22, p. 206; May 3, p. 198  
 Air impellers, Oct. 4, p. 88  
 Airplane refueling, in flight, May 31, p. 10  
 Aluminum and alloys, Jan. 23, p. 10, 70, 76; Apr. 19, p. 103, 164; Aug. 23, p. 147  
 Aluminum extrusions, stepped, Nov. 1, p. 116  
 Aluminum foil, Apr. 19, p. 163  
 Amplifiers, July 26, p. 112; Oct. 18, p. 191; Dec. 27, p. 113  
 Analog simulators, Aug. 9, p. 86  
 Antenna, vacuum operated, May 3, p. 107  
 Appearance models, prototype, Mar. 8, p. 118





Assembly machine, automatic, June 14, p. 110  
 Automobiles, May 17, p. 6  
     1956, Jan. 12, p. 6  
     1957, Nov. 15, p. 10; Nov. 29, p. 10; Dec. 13, p. 10; Dec. 27, p. 12  
     small, Nov. 29, p. 8  
 Autotransformers, Mar. 8, p. 159

## B

Balancing machine, May 31, p. 116  
 Ball-bearing lubricants, Oct. 18, p. 101  
 Balls, Mar. 8, p. 136; June 28, p. 114  
 Band saw, large, Apr. 5, p. 104  
 Batteries, Feb. 9, p. 14; May 17, p. 12; Sept. 20, p. 6; Dec. 13, p. 162  
     sun, Apr. 5, p. 148  
 Beam deflection due to shear, Feb. 9, p. 129  
 Beam design, Jan. 12, p. 125  
 Beams, cantilever, Jan. 26, p. 97  
 Bearing housing caps, May 3, p. 150  
 Bearing loads, V-belt drive, Mar. 22, p. 137  
 Bearing materials, May 3, p. 105; May 31, p. 108; Sept. 6, p. 182; Oct. 4, p. 176  
 Bearings, air, Oct. 4, p. 15  
     ball, Feb. 23, p. 127; Mar. 22, p. 155; May 3, p. 83; May 31, p. 153; Sept. 20, p. 114; Oct. 18, p. 101; Dec. 27, p. 104  
     ball, for high speeds, Nov. 15, p. 88  
     linear motion, Dec. 13, p. 160  
     pivoted-shoe radial, Dec. 27, p. 63  
     rod-end, Apr. 5, p. 152; Nov. 29, p. 164  
     roller, May 31, p. 153; Aug. 9, p. 82; Nov. 15, p. 192  
     sleeve, Jan. 12, p. 99; Feb. 9, p. 119, 142; Mar. 22, p. 169; May 3, p. 139; June 14, p. 119, 143; July 26, p. 118; Sept. 6, p. 150; Nov. 15, p. 168; Nov. 29, p. 164  
     spin, Oct. 18, p. 240  
     thrust, July 26, p. 118; Aug. 23, p. 103  
 Bellows, Jan. 26, p. 149  
 Belts, conveyor, May 31, p. 6; Oct. 4, p. 15; Dec. 27, p. 106  
     transmission, Apr. 5, p. 154; Aug. 9, p. 132, 141; Oct. 4, p. 105; Dec. 27, p. 106  
 Blind tapped holes, July 26, p. 99  
 Blowers, Feb. 23, p. 152; May 31, p. 172; June 14, p. 206; June 28, p. 88, 116; July 12, p. 172; Aug. 9, p. 138; Sept. 20, p. 184; Oct. 4, p. 138, 152  
 Boats, plastic, June 28, p. 14  
 Boots, toggle-switch, July 12, p. 176  
 Brakes, Jan. 26, p. 63; Feb. 23, p. 154; Mar. 8, p. 82, 184; Apr. 5, p. 113; Apr. 19, p. 170; May 3, p. 139; June 14, p. 135; July 12, p. 143; Aug. 9, p. 132; Sept. 6, p. 146; Sept. 20, p. 190; Oct. 4, p. 160, 176; Oct. 18, p. 240; Dec. 13, p. 191  
 Braking, electric-motor, Jan. 12, p. 103  
 Brass (see copper and alloys)  
 Brazing, Feb. 23, p. 116; Oct. 18, p. 97  
     tube, Jan. 26, p. 12  
 Bronze (see copper and alloys)  
 Bushings, ball, Dec. 13, p. 160

## C

Cabinets, Oct. 18, p. 170; Dec. 13, p. 236  
 Cables, electric, July 26, p. 92  
 Calculators, adding machines as, Dec. 13, p. 113  
 Camera, movie, Apr. 19, p. 196  
 Cameras, high-speed, Oct. 18, p. 122  
 Cams, Jan. 12, p. 141; Jan. 26, p. 85; Feb. 9, p. 117; Mar. 8, p. 100; Apr. 5, p. 120; Aug. 9, p. 81, 103; Oct. 18, p. 107; Nov. 1, p. 92; Dec. 13, p. 129  
 Capacitors, Jan. 12, p. 180; Feb. 9, p. 158; Mar. 8, p. 162; May 17, p. 14; Aug. 9, p. 130  
 Caps, bushing, May 31, p. 174  
 Carbides, fastening and joining, Mar. 22, p. 122  
 Cardboard mockups, Oct. 4, p. 76  
 Cases, instrument, Sept. 20, p. 193  
 Cases and covers, July 12, p. 94  
 Castings, continuous, Sept. 20, p. 12  
     die, Jan. 12, p. 15; June 14, p. 112; July 26, p. 85; Aug. 23, p. 147  
     die, cold-forming, Nov. 29, p. 88  
     investment, Jan. 26, p. 60

light alloy, Feb. 9, p. 131; May 17, p. 101; Aug. 23, p. 138  
     steel, Apr. 19, p. 8; Nov. 15, p. 128  
 Cast iron, threaded, Nov. 29, p. 172  
 Center of gravity, locating, May 3, p. 104  
 Ceramic materials, Mar. 22, p. 139  
 Ceramics, Dec. 27, p. 96  
 Cermets, Apr. 19, p. 143  
 Chain, transmission, May 3, p. 206; May 17, p. 128; July 12, p. 176  
 Chuck, locking, Mar. 8, p. 76  
 Circle locations, Feb. 23, p. 126  
 Circle segments, areas of, Sept. 6, p. 119  
 Circuit breakers, Dec. 27, p. 110  
 Circuits, etched, May 3, p. 142  
     printed, May 3, p. 148  
     standardized, Jan. 12, p. 5  
 Clamping, cam-actuated, Nov. 15, p. 118  
 Clamps, May 31, p. 163; June 14, p. 200, 222; Dec. 13, p. 101, 160  
 Cleats, motor-mount, Oct. 18, p. 185  
 Clock, astronomical, Mar. 22, p. 12  
 Clothes dryer with moisture condenser, Feb. 23, p. 122  
 Clothing for engineers, Sept. 6, p. 72  
 Clutches, Jan. 12, p. 203; Jan. 26, p. 96, 152; Feb. 9, p. 89, 192, 194; Feb. 23, p. 160; Mar. 8, p. 82, 186; Mar. 22, p. 162, 216; Apr. 5, p. 89, 113, 144; Apr. 19, p. 12, 101, 107, 160, 216, 218; May 3, p. 139; May 17, p. 68, 69, 158, 160; May 31, p. 192, 194; June 14, p. 260, 264, 265; June 28, p. 142; July 12, p. 210; July 26, p. 67; Aug. 9, p. 132; Aug. 23, p. 185, 262; Sept. 6, p. 134; Sept. 20, p. 184; Oct. 4, p. 132, 174, 176; Oct. 18, p. 240; Nov. 1, p. 80, 150; Dec. 13, p. 160, 177; Dec. 27, p. 104, 119  
     miniature mechanical, Oct. 18, p. 124  
 Coatings (see also Finishes)  
 Coatings, protective, Jan. 12, p. 164; Mar. 8, p. 5; Apr. 5, p. 12; Apr. 19, p. 14; May 17, p. 10; June 14, p. 208; July 26, p. 124; Sept. 20, p. 15; Nov. 15, p. 148; Dec. 13, p. 180, 194; Dec. 27, p. 96  
 Coding methods, numerical, June 28, p. 100  
 Coffee vending machine, Mar. 22, p. 14  
 Cold roll forming, Dec. 13, p. 106  
 Collars, shaft, Feb. 23, p. 154  
 Collets, Feb. 9, p. 89  
 Columns, Dec. 13, p. 137  
 Combinations, patents of, Nov. 15, p. 85  
 Comparator on grinder, Mar. 8, p. 107  
 Compression forming, Aug. 23, p. 6  
 Compressors, Dec. 13, p. 234  
 Computer components, July 26, p. 112; Aug. 9, p. 136; Aug. 23, p. 178; Sept. 20, p. 158; Dec. 27, p. 62  
 Computers, Feb. 9, p. 134; Feb. 23, p. 88; Apr. 5, p. 6, 12; May 17, p. 5; June 14, p. 6; July 12, p. 6; Aug. 9, p. 86, 154; Aug. 23, p. 214; Sept. 6, p. 106; Oct. 4, p. 119; Oct. 18, p. 194; Nov. 1, p. 141; Dec. 13, p. 113, 140, 200  
     electronics, Jan. 26, p. 5, 15  
 Condensers, May 17, p. 142  
 Conduit, Aug. 9, p. 132  
     plastic, Apr. 5, p. 152  
 Connections, flanged, Nov. 1, p. 109  
 Connectors, electric, Jan. 12, p. 174; Feb. 9, p. 163; Feb. 23, p. 154; Mar. 22, p. 155, 168; Apr. 5, p. 158; May 17, p. 124, 130; May 31, p. 156; June 14, p. 220; June 28, p. 130; July 26, p. 92; Aug. 9, p. 144, 148; Aug. 23, p. 12, 190; Oct. 18, p. 182; Nov. 1, p. 127, 136; Dec. 13, p. 172  
 Contacts, Dec. 27, p. 110  
 Contents, Feb. 9, p. 10; May 3, p. 6  
 Control, torque, Nov. 29, p. 119  
 Control panels, June 14, p. 99  
 Control systems, automatic, May 17, p. 70  
     electric, Jan. 12, p. 183; Mar. 8, p. 134; May 3, p. 177; July 26, p. 122; Aug. 9, p. 82; Oct. 4, p. 144; Nov. 29, p. 86, 89, 120, 142, 166; Dec. 13, p. 122, 182  
     hydraulic, Aug. 9, p. 121; Sept. 6, p. 80; Nov. 15, p. 155; Dec. 13, p. 122  
     pneumatic, May 3, p. 170  
 Controls, automatic, Jan. 12, p. 22, 100, 118; Jan. 26, p. 6; Feb. 9, p. 142, 158, 192; Mar. 8, p. 136, 144; May 17, p. 123; May 31, p. 5; June 14, p. 230; June 28, p. 100; July 12, p. 162, 174; July 26, p. 112, 115; Aug. 9, p. 132; Sept. 20, p. 132; Oct. 18, p. 12; Nov. 1, p. 81; Nov. 29, p. 86; Dec. 13, p. 168; Dec. 27, p. 111  
     cable, May 17, p. 123



computer, Oct. 4, p. 119  
 electric, Feb. 23, p. 174; Mar. 8, p. 22, 75; Mar. 22, p. 183; Apr. 5, p. 196; June 28, p. 131; July 12, p. 174; Aug. 23, p. 95; Sept. 20, p. 109; Nov. 29, p. 89  
 fusion-temperature, Dec. 13, p. 115  
 hydraulic, May 17, p. 123  
 mechanical, Feb. 23, p. 154; May 17, p. 158, 160; July 12, p. 148; Sept. 20, p. 98, 244; Nov. 15, p. 84, 143  
 pneumatic, Mar. 8, p. 134; Mar. 22, p. 120; Aug. 9, p. 170; Sept. 20, p. 198  
 temperature, Oct. 4, p. 134  
 Converter, analog-digital, July 26, p. 112  
 Conveyors, Oct. 4, p. 6  
 Copper and alloys, Jan. 12, p. 169; Jan. 26, p. 108; Aug. 9, p. 5; Dec. 13, p. 188  
 Corners, spherical, May 3, p. 140  
 Corrosion-resistant materials, May 31, p. 104  
 Costs, manufacturing, controlling, Aug. 9, p. 119  
 Counters, Feb. 23, p. 172; Mar. 8, p. 158; Mar. 22, p. 156, 165; May 3, p. 164; Sept. 20, p. 172; Oct. 4, p. 162; Nov. 15, p. 175  
 Couplings, fluid, May 3, p. 108; June 28, p. 126; Aug. 9, p. 146  
   magnetic, slip, Oct. 4, p. 84  
   shaft, Jan. 12, p. 204; Feb. 9, p. 194; Feb. 23, p. 94, 152; Apr. 5, p. 168; May 17, p. 120, 126, 158; June 14, p. 264; June 28, p. 110, 144; July 12, p. 208; Aug. 9, p. 170; Aug. 23, p. 196; Sept. 20, p. 99, 164; Oct. 18, p. 157; Nov. 15, p. 192  
 Covers and cases, July 12, p. 94  
 Creative potential, May 3, p. 119  
 Cutting material, synthetic, June 14, p. 26  
 Cycloid speed reducer, June 28, p. 65  
 Cylinders, June 14, p. 196  
   hydraulic, Feb. 9, p. 142; July 26, p. 118; Aug. 23, p. 172  
   pneumatic, Feb. 23, p. 165  
   pressurized, Feb. 23, p. 135

## D

Damper, flow pulsation, Apr. 5, p. 89  
   hydraulic flow, May 3, p. 206  
 Damping materials, Apr. 19, p. 119  
 Data reduction system, Apr. 19, p. 195  
 Designing and manufacturing, Aug. 23, p. 158  
 Dials, Aug. 23, p. 202; Sept. 6, p. 154; Oct. 4, p. 132; Nov. 1, p. 81; Dec. 27, p. 106  
 Diaphragms, Mar. 22, p. 159  
 Dictating machine, small, Apr. 19, p. 122  
 Dictation equipment, Dec. 13, p. 94  
 Differential chain drive, May 3, p. 206  
 Differentials, gear, Oct. 4, p. 156; Nov. 29, p. 162  
   miniature, Jan. 26, p. 118  
   nonslip, Apr. 19, p. 102  
 Dimension control, Apr. 5, p. 82; Apr. 19, p. 112; May 3, p. 92; May 17, p. 79; June 14, p. 113; June 28, p. 82; July 12, p. 110  
 Dimensioning, May 31, p. 129  
 Diode, silicon, Aug. 23, p. 199  
 Disassembly, design for, May 31, p. 130  
 Domestic and commercial machines, Feb. 23, p. 192  
 Domestic equipment, Nov. 15, p. 185; Dec. 27, p. 116  
 Domestic machines, Mar. 22, p. 206; May 17, p. 152; July 12, p. 198; Aug. 23, p. 238; Sept. 20, p. 222  
 Drafting, simplified, Apr. 19, p. 96  
 Drafting equipment, Jan. 12, p. 186; Jan. 26, p. 64, 89, 132; Feb. 9, p. 166, 168; Feb. 23, p. 182; Mar. 8, p. 91; Mar. 22, p. 106, 190; Apr. 5, p. 110, 119, 170; Apr. 19, p. 132, 192; May 3, p. 82, 174, 178; May 17, p. 75, 146; May 31, p. 98, 107, 179; June 14, p. 228, 230; June 28, p. 133, 134; July 26, p. 125; Aug. 9, p. 152, 154; Aug. 23, p. 209, 212; Sept. 6, p. 166; Sept. 20, p. 206; Nov. 1, p. 142; Dec. 13, p. 196, 202; Dec. 27, p. 93, 112  
 Drawings, perspective, Dec. 13, p. 102  
 Drawn parts, Jan. 12, p. 121  
 Drawn titanium, Aug. 23, p. 153  
 Drill press, portable, June 14, p. 128  
 Drive shafts, shielded, Feb. 9, p. 154  
 Drives, adjustable speed, Jan. 26, p. 123, 127; Feb. 9, p. 90; Apr. 19, p. 160; May 3, p. 90; May 31, p. 153, 154; July 12, p. 142; July 26, p. 110; Aug. 9, p. 130; Sept. 6, p. 82; Sept. 20, p. 145; Oct. 4, p. 132, 144; Oct. 18, p. 142; Nov. 29, p. 120  
   electronic, Nov. 15, p. 123

ultrahigh-speed, Dec. 13, p. 232  
 Ductility specifying, Jan. 12, p. 133

## E

Education, engineering, Apr. 19, p. 14  
 Electric equipment (see specific type)  
 Electronic components, heat-resistant, Oct. 18, p. 5  
 Electronic drives, Nov. 15, p. 123  
 Electronic equipment, June 14, p. 94; June 28, p. 70; July 26, p. 92; Aug. 9, p. 99; Sept. 6, p. 115, 124; Sept. 20, p. 109; Oct. 4, p. 96; Oct. 18, p. 135; Nov. 15, p. 111; Dec. 13, p. 124; Dec. 27, p. 86  
 Electronic tube and semiconductor data, May 3, p. 15  
 Electroplating, Mar. 8, p. 113  
 Engineer in court, Aug. 23, p. 90  
 Engineering department (see Management or Drafting)  
 Engineering operations, evaluating, Nov. 1, p. 74  
 Engineering organization, Nov. 29, p. 82  
 Engineers, women, Jan. 12, p. 12  
 Engineers and scientists, Aug. 23, p. 160  
 Engines, Feb. 9, p. 133; Mar. 22, p. 112, 162; July 12, p. 12; Oct. 4, p. 6; Oct. 18, p. 5; Nov. 1, p. 136  
 Extrusion, July 12, p. 126

## F

Fabric parts, July 12, p. 142; Sept. 6, p. 153; Sept. 20, p. 160  
 Fastener finishes, Aug. 23, p. 149  
 Fasteners, Aug. 23, p. 105; Nov. 15, p. 116  
   blind, May 3, p. 145; July 12, p. 154  
   bolts, nuts, screws, Jan. 12, p. 169, 172; Jan. 26, p. 118; Feb. 9, p. 145, 146, 160; Feb. 23, p. 154, 158, 162; Mar. 8, p. 134; Mar. 22, p. 165, 174; May 3, p. 84, 145; May 17, p. 120, 130; May 31, p. 10, 153, 154; June 14, p. 188; June 28, p. 97, 104; July 12, p. 142, 149, 154; July 26, p. 121; Aug. 9, p. 130; Aug. 23, p. 110, 129, 139, 185; Sept. 6, p. 83; Sept. 20, p. 170, 246; Oct. 4, p. 84, 132, 156; Nov. 1, p. 127, 133; Nov. 29, p. 5, 156; Dec. 13, p. 162, 172; Dec. 27, p. 106  
   clips, Jan. 26, p. 127  
   insert, Mar. 22, p. 155; Apr. 19, p. 163; May 3, p. 142, 145; May 31, p. 6; July 12, p. 82, 154; Aug. 23, p. 107; Oct. 4, p. 141; Dec. 13, p. 174  
   locking, Aug. 9, p. 136; Oct. 4, p. 132  
   miniature, Aug. 23, p. 139  
   molding plastic, Sept. 20, p. 121  
   pin, Jan. 26, p. 124; Feb. 9, p. 164; July 12, p. 210; Aug. 23, p. 121  
   retaining rings, May 31, p. 160; Aug. 23, p. 122; Dec. 27, p. 67  
   rivet, July 12, p. 149; Aug. 23, p. 96, 124, 181  
   self-sealing, Aug. 23, p. 145  
   stud, Aug. 23, p. 129  
 Fastening and joining plastics, Feb. 9, p. 94  
 Felt, Jan. 26, p. 91  
 Fiber, Dec. 27, p. 77  
   vulcanized, Feb. 9, p. 100  
 File, technical, Feb. 9, p. 91  
 Filing engineering drawing, Dec. 27, p. 93  
 Fillets, gear root, Sept. 20, p. 105  
 Filters, Feb. 23, p. 178; May 31, p. 12, 159; Aug. 9, p. 147; Nov. 1, p. 130; Nov. 15, p. 143  
   electronic, Oct. 4, p. 164  
 Finishes, machined, Apr. 5, p. 134  
   protective, Aug. 23, p. 149; Nov. 29, p. 169  
 Fire fighter, remote controlled, Feb. 23, p. 10  
 Fittings, conduit, Jan. 26, p. 127  
   pipe, tube and hose, Jan. 26, p. 120; Mar. 8, p. 138; Mar. 22, p. 172; Apr. 5, p. 156, 162; Apr. 19, p. 166; May 31, p. 154; June 14, p. 200, 217; July 12, p. 146; Sept. 6, p. 140, 146, 150, 158; Sept. 20, p. 168, 181; Nov. 1, p. 128; Nov. 29, p. 154  
 Flange joints, bolted, Nov. 15, p. 119  
 Flanged connections, Nov. 1, p. 109  
 Flow meters, Mar. 22, p. 98; Oct. 4, p. 165  
 Flywheel, hydraulic, Nov. 15, p. 190  
 Focusing, automatic, for aerial camera, Feb. 9, p. 98  
 Force indicators, Apr. 19, p. 192  
 Forging, Jan. 26, p. 76





Forming, cold roll, Dec. 13, p. 106  
 Fretting corrosion, Jan. 26, p. 104  
 Friction in mechanisms, Feb. 23, p. 123  
 Friction materials, Apr. 19, p. 174; Aug. 23, p. 185; Nov. 29, p. 139  
 Fuel injection system, Dec. 13, p. 8  
 Fuses, Mar. 8, p. 77  
 Fusion-temperature controls, Dec. 13, p. 115

## G

Gages, force, May 31, p. 180  
 pressure, etc. (see also Instruments), Nov. 29, p. 87, 180  
 pressure, continuous, Aug. 23, p. 8  
 spring tension, Aug. 23, p. 209  
 Gas liquefier, small, Oct. 18, p. 8  
 Gas turbine produces fog, Jan. 26, p. 8  
 Gas turbines, Oct. 4, p. 10  
 Gasket materials, May 31, p. 117  
 Gaskets, May 3, p. 84, 140; May 17, p. 76  
 Gear drives, planetary, Feb. 9, p. 101  
 Gear ratio with limit stops, Nov. 1, p. 108  
 Gear ratio selection, Mar. 8, p. 108  
 Gear shaping, Feb. 9, p. 10  
 Gear systems, epicyclic, Nov. 29, p. 129  
 Gears, Jan. 12, p. 137; Jan. 26, p. 62, 69, 132; Feb. 23, p. 103; Mar. 8, p. 134, 167; Mar. 22, p. 132, 142; Apr. 5, p. 93, 144; Apr. 19, p. 123, 172; May 3, p. 117; May 17, p. 90, 134; May 31, p. 153, 164; June 14, p. 196; June 28, p. 110; Aug. 23, p. 262; Sept. 20, p. 105, 162; Oct. 4, p. 10; Oct. 18, p. 173  
 face, geometry of, Oct. 4, p. 106  
 plastic, capacity of, Sept. 6, p. 120  
 testing, July 26, p. 95  
 Generators, Aug. 23, p. 190  
 electric, Feb. 23, p. 165; May 17, p. 134; July 12, p. 168  
 Geneva mechanisms, Mar. 22, p. 107; Dec. 27, p. 91  
 Germanium rectifiers, Jan. 26, p. 71  
 Gland, packing, Nov. 15, p. 141  
 Glass, Mar. 22, p. 175; June 28, p. 114; Aug. 23, p. 5, 15; Nov. 29, p. 154  
 Glass fiber, Apr. 5, p. 22; July 26, p. 12; Aug. 9, p. 130  
 Glass-mat laminates, Sept. 6, p. 144; Nov. 1, p. 130  
 Governor contracts, engineering on, Aug. 9, p. 76  
 Government research reports, Oct. 18, p. 99  
 Governors, Feb. 9, p. 162; June 14, p. 193. Aug. 23, p. 260  
 Graphite, welded, Nov. 1, p. 12  
 Grinder design, simplified, Aug. 23, p. 138  
 Grinding, May 17, p. 112  
 Grinding machine, Oct. 4, 105  
 Grommets, Feb. 9, p. 148; Aug. 9, p. 146  
 Gyroscope, vibrating, Nov. 1, p. 14  
 Gyroscope, Nov. 29, p. 178

## H

Handles, Mar. 22, p. 184; May 17, p. 128; Oct. 18, p. 160; Nov. 15, p. 148; Dec. 13, p. 166  
 Heaters, Jan. 12, p. 180; May 3, 166; June 28, p. 116; Nov. 29, p. 154; Dec. 13, p. 194  
 Heat exchangers, Jan. 26, p. 6; Apr. 19, p. 160; June 14, p. 198; July 12, p. 83; Aug. 23, p. 170  
 Heat resistant alloys, June 14, p. 15; Sept. 6, p. 15; Oct. 18, p. 176  
 Heat transfer, May 31, p. 137  
 Heating, induction, Nov. 15, p. 84  
 High-temperature hydraulics, Aug. 9, p. 121  
 High-temperature materials, May 31, p. 95  
 Hinges, Jan. 12, p. 182; Mar. 22, p. 174  
 History of machines, May 3, p. 74; June 14, p. 101; July 12, p. 84  
 Hose, metallic, Mar. 22, p. 171  
 nonmetallic, Sept. 6, p. 146; Sept. 20, p. 160; Nov. 29, p. 162  
 Hydraulic circuits, safe, Nov. 15, p. 107  
 Hydraulic equipment (see specific type)  
 Hydraulic lines, pressure losses in, Oct. 4, p. 113  
 Hydraulic servo components, Nov. 29, p. 114; Dec. 27, p. 73

## I

Impact strength in bolts, June 28, p. 104

Impellers, air, Oct. 4, p. 88  
 two-piece, July 12, p. 83  
 Increasers, speed, June 14, p. 214  
 Indicators, flow, June 28, p. 112; July 26, p. 125  
 lamp, Mar. 8, p. 150  
 Inductance, variable, Sept. 6, p. 160  
 Industrial design, Jan. 12, p. 117; Feb. 9, p. 116; Mar. 8, p. 99; Mar. 22, p. 119; Apr. 5, p. 112; July 26, p. 10; Sept. 6, p. 79  
 Inspection, Jan. 26, p. 146; Feb. 23, p. 198; Mar. 8, p. 182; Apr. 5, p. 194; May 3, p. 14, 204; May 17, p. 88; May 31, p. 25, 190; June 14, p. 258; July 12, p. 207; July 26, p. 135; Aug. 23, p. 250; Sept. 20, p. 10, 15, 230; Oct. 4, p. 173; Nov. 29, p. 192; Dec. 13, p. 217  
 Instrument cases, Oct. 18, p. 182  
 Instruments, Feb. 9, p. 158, 166, 168; Feb. 23, p. 177, 180, 181; Mar. 8, p. 14, 162, 164; Mar. 22, p. 190; Apr. 19, p. 10, 195; May 17, p. 22, 144; June 14, p. 225, 228, 230, 232; July 12, p. 10, 180; July 26, p. 67, 125; Aug. 9, p. 152; Aug. 23, p. 10; Sept. 6, p. 164, 166, 182; Sept. 20, p. 5, 8, 15, 200, 204; Oct. 18, p. 197; Nov. 1, p. 141, 142; Nov. 15, p. 175, 178; Nov. 29, p. 6, 180; Dec. 13, p. 5, 196, 198; Dec. 27, p. 112  
 Insulation, Apr. 5, p. 168; May 17, p. 10; May 31, p. 90; June 28, p. 5; Aug. 9, p. 134, 144; Sept. 20, p. 181; Nov. 29, p. 87; Dec. 27, p. 109  
 Insulators, Mar. 8, p. 154  
 Interviews, job-performance, Nov. 15, p. 76  
 Inventions, commercializing, Sept. 20, p. 100  
 Inventions wanted, May 31, p. 12

## J, L

Job-performance interviews, Nov. 15, p. 76  
 Laminations, core, Oct. 18, p. 189  
 Language translating machines, July 12, p. 5  
 Lapping machine, Apr. 5, p. 92  
 Large engineering projects, Dec. 27, p. 54  
 Latches, Jan. 12, p. 178; Feb. 9, p. 145; May 3, p. 152  
 magnetic, Dec. 13, p. 146  
 Lead-plastic compounds, Nov. 29, p. 174  
 Library systems and services, July 26, p. 58  
 Lift truck for hazardous locations, May 31, p. 125  
 Light alloys, May 31, p. 86  
 Light amplifier, Mar. 8, p. 8  
 Lighting, Apr. 5, p. 10; Aug. 9, p. 136, 142; Sept. 20, p. 166; Oct. 18, p. 10, 160, 170, 185, 194  
 Lighting, engineering department, Mar. 22, p. 88  
 Lights, indicator, Feb. 9, p. 152  
 Limit stop, Feb. 23, p. 174  
 gear ratio with, Nov. 1, p. 108  
 Linear actuator, Mar. 22, p. 97  
 Liners, applied, welding, July 26, p. 86  
 Locking hub, quick-release, Oct. 18, p. 97  
 Locking plate, slotted, Oct. 18, p. 98  
 Low cost, designing for, June 14, p. 156  
 Low-temperature metals, May 31, p. 111  
 Lubricants, May 31, p. 8, 175; Sept. 6, p. 12  
 for ball bearings, Oct. 18, p. 101  
 Lubrication, gear, Jan. 12, p. 137  
 valve, Dec. 13, p. 101  
 Lubrication equipment, Jan. 12, p. 166; Mar. 8, p. 76, 152; Apr. 19, p. 186; May 3, p. 170; May 31, p. 166; June 28, p. 124; Aug. 23, p. 192; Sept. 20, p. 114; Oct. 4, p. 159; Nov. 15, p. 146  
 Lubrication of sleeve bearings, July 12, p. 99

## M

Machines (see specific type or process)  
 Magnesium and alloys, Feb. 9, p. 131; Feb. 23, p. 137; May 17, p. 101; June 14, p. 6; Sept. 20, p. 168  
 Magnetic amplifiers, Jan. 12, p. 14  
 Magnets, Mar. 22, p. 159; July 26, p. 5; Nov. 15, p. 172  
 Maintainability, designing for, June 14, p. 94; June 28, p. 70  
 Maintenance accesses in electronic equipment, Aug. 9, p. 99  
 auxiliaries for electronic equipment, Nov. 15, p. 111



instructions, Dec. 27, p. 86  
 Management, engineering, Jan. 12, p. 92; Jan. 26, p. 56, 64, 90; Feb. 9, p. 80, 91; Mar. 8, p. 70; Mar. 22, p. 88; May 3, p. 119; May 17, p. 62, 106; May 31, p. 78; June 28, p. 56; July 26, p. 104; Aug. 9, p. 76, 83; Aug. 23, p. 158; Sept. 20, p. 5, 10; Oct. 18, p. 6, 15, 148; Nov. 1, p. 74; Nov. 29, p. 82, 141; Dec. 27, p. 5, 10, 54, 93  
 Manufacturing and designing, Aug. 23, p. 158  
 Markers, wire, July 12, p. 164  
 Materials (see specific type)  
 Materials, engineering, May 31, p. 85  
   handling, Feb. 9, p. 184; Mar. 8, p. 178; Apr. 5, p. 188; Apr. 19, p. 206; May 3, p. 198; May 31, p. 188; June 14, p. 248; June 28, p. 138; July 12, p. 198; July 26, p. 132; Aug. 23, p. 240; Sept. 6, p. 172; Sept. 20, p. 224; Oct. 4, p. 170; Oct. 18, p. 217; Dec. 13, p. 210; Dec. 27, p. 117  
 Mathematics, May 17, p. 84  
 Mechanics, physical, Apr. 5, p. 121  
 Mechanisms, rolling-contact, July 26, p. 75  
 Meetings, Jan. 12, p. 24; Jan. 26, p. 22; Feb. 9, p. 24; Feb. 23, p. 22; Mar. 8, p. 27; Mar. 22, p. 5, 6, 22; Apr. 5, p. 5, 8, 10, 24; Apr. 19, p. 5, 6, 24; May 3, p. 5, 8, 24, 25; May 17, p. 5, 24; May 31, p. 25; June 14, p. 5, 12, 28; June 28, p. 10, 22; July 12, p. 24; July 26, p. 15; Aug. 9, p. 22; Aug. 23, p. 25; Sept. 6, p. 6, 10, 24; Sept. 20, p. 26; Oct. 4, p. 22; Oct. 18, p. 24; Nov. 1, p. 15; Nov. 15, p. 24; Nov. 29, p. 24; Dec. 13, p. 24  
 Merit evaluation, May 31, p. 78  
 Metals (see specific type)  
 Metals, Mar. 22, p. 176; June 28, p. 128; July 12, p. 149; Nov. 1, p. 138; Dec. 13, p. 162  
   removal, chemical, July 26, p. 66  
 Metal-ceramic friction materials, Nov. 29, p. 139  
 Metalworking, Jan. 12, p. 201; Jan. 26, p. 144; Feb. 9, p. 184; Feb. 23, p. 194; Mar. 8, p. 179; Mar. 22, p. 208; Apr. 5, p. 188; Apr. 19, p. 208; May 3, p. 200; May 17, p. 152; May 31, p. 188; June 14, p. 250; June 28, p. 140; July 12, p. 200; July 26, p. 132; Aug. 9, p. 163; Aug. 23, p. 242; Sept. 6, p. 174; Sept. 20, p. 227; Oct. 4, p. 170, 171; Oct. 18, p. 217; Nov. 1, p. 145; Nov. 15, p. 186; Nov. 29, p. 190; Dec. 13, p. 210; Dec. 27, p. 117  
 Metering liquids, Aug. 23, p. 95  
 Meters, flow, May 31, p. 84  
 Mill, enclosed, for nuclear fuels, Dec. 13, p. 6  
 Milling machine, electronically controlled, Nov. 1, p. 5  
 Mockups, cardboard, Oct. 4, p. 76  
 Modulator, induction, July 12, p. 144  
 Mohr's circles, Jan. 12, p. 119  
 Monitor, vibration, Jan. 26, p. 124  
 Motors, electric: air compressor, May 17, p. 140  
   bases, Apr. 19, p. 166  
   brakemotors, Mar. 8, p. 145, 159; Apr. 5, p. 156  
   for flywheels, Apr. 5, p. 106  
   fractional and integral hp, Jan. 12, p. 164, 175; Feb. 9, p. 150; Feb. 23, p. 93, 162, 168, 172; Mar. 22, p. 156, 178; Apr. 19, p. 164, 184, 190; May 3, p. 90; May 17, p. 137; May 31, p. 140, 154; June 14, p. 6, 222; June 28, p. 112, 118; July 12, p. 121; July 26, p. 10; Aug. 23, p. 181; Sept. 6, p. 138, 148, 156; Oct. 4, p. 156; Oct. 18, p. 142, 164; Dec. 13, p. 180  
   gearmotors, Mar. 8, p. 142; Apr. 5, p. 156, 158; June 14, p. 185; July 26, p. 112, 120; Nov. 1, p. 128; Dec. 27, p. 106  
   positioning, Feb. 9, p. 156  
   pump motors, May 17, p. 132  
   subfractional, Jan. 12, p. 162; Mar. 8, p. 159; Apr. 5, p. 156, 158; Apr. 19, p. 176, 182; May 3, p. 148; May 31, p. 160; July 12, p. 146; Sept. 20, p. 164; Oct. 4, p. 146; Oct. 18, p. 158; Dec. 27, p. 108  
   winding, Nov. 1, p. 137  
 Motors, hydraulic, Apr. 5, p. 150; July 12, p. 117; July 26, p. 136; Nov. 15, p. 158  
 Motors, pneumatic, Feb. 9, p. 160; June 28, p. 112; Oct. 4, p. 134  
 Motors, torque, Jan. 12, p. 143; Aug. 9, p. 141  
 Mountings, vibration and shock, Feb. 9, p. 164; Mar. 22, p. 15, 169; May 3, p. 166; June 14, p. 98; Sept. 6, p. 160; Sept. 20, p. 99; Dec. 13, p. 184  
 Mounting on motors, Apr. 5, p. 88  
 supports, multiple, May 31, p. 84  
 Muffler, Feb. 23, p. 152

## N

Nameplates, Feb. 9, p. 8; May 17, p. 140  
 Noise and vibration control, July 26, p. 68  
   measurement, July 12, p. 10  
 Numbering systems, May 17, p. 106  
 Nylon, designing with, Mar. 8, p. 95

## O

Office equipment, June 14, p. 252; July 26, p. 126; Nov. 15, p. 5  
 Ohmmeters, May 31, p. 179  
 Oil grooves for sleeve bearings, July 12, p. 99  
   in bearings, June 14, p. 119  
 One-way motion control, June 14, p. 262  
 Oscillographic recorder, Apr. 5, p. 170; June 28, p. 133; Sept. 20, p. 202; Dec. 13, p. 198  
 Oscilloscope, Apr. 5, p. 171

## P

Packaging, Mar. 22, p. 212; June 14, p. 254  
   equipment, Aug. 9, p. 164; Nov. 1, p. 146  
 Packings, Jan. 12, p. 162; June 28, p. 122  
   materials, May 31, p. 117  
 Paint-mixing machines, July 12, p. 116  
 Pallet truck, Oct. 4, p. 99  
 Part numbers, ink-stamped, Jan. 26, p. 84  
 Passenger car, two-level, June 28, p. 14  
 Patent applications, Oct. 4, p. 85  
   design, Jan. 12, p. 114  
   licenses and assignments, June 14, p. 129  
   licensing, Apr. 5, p. 90  
   litigation, June 14, p. 154  
   of combinations, Nov. 15, p. 85  
 Patterns, expendable plastic, June 28, p. 12  
 Perspective drawings, Dec. 13, p. 102  
 Photocells, June 14, p. 206  
 Photoconductive cells, Aug. 23, p. 192  
 Photocopier, Jan. 26, p. 132  
 Phototube, multiplier, Dec. 13, p. 170  
 Pile driver, largest, Mar. 8, p. 14  
 Pinion shafts, Feb. 9, p. 145  
 Pipe, Mar. 22, p. 155; May 31, p. 153; July 26, p. 110  
 Piston, free, pile driver, Aug. 9, p. 105  
   plastic-clad, Mar. 22, p. 98  
 Plant equipment, Apr. 19, p. 210; July 26, p. 134; Dec. 13, p. 128  
 Plaster-mold castings, magnesium, Feb. 9, p. 131  
 Plastics, Jan. 12, p. 145; Feb. 9, p. 12; Feb. 23, p. 8, 95, 180; Mar. 8, p. 95; Apr. 5, p. 14; Apr. 19, p. 188; May 3, p. 148, 152, 160, 168; May 17, p. 15, 140; May 31, p. 12; June 14, p. 27, 143, 188; June 28, p. 6, 14, 15, 97; Aug. 9, p. 6; Aug. 23, p. 12; Sept. 6, p. 81, 136; Sept. 20, p. 158; Oct. 4, p. 6, 12; Oct. 18, p. 163; Nov. 29, p. 154; Dec. 13, p. 164; Dec. 27, p. 77  
   fastening and joining, Feb. 9, p. 94  
   gears, capacity of, Sept. 6, p. 120  
   molding, Feb. 9, p. 155; May 3, p. 12, 85; Aug. 23, p. 24  
   silencer for paper mill, Nov. 1, p. 10  
   vacuum-formed, Mar. 22, p. 114  
 Plugs, Feb. 9, p. 152  
 Pneumatic equipment (see specific type)  
 Portable tools, Jan. 12, p. 202; Apr. 5, p. 192  
 Positioning device, Jan. 26, p. 68  
 Potentiometers, Feb. 9, p. 146; Mar. 8, p. 134, 137; Apr. 5, p. 166; May 3, p. 139, 150; May 17, p. 137; May 31, p. 172; June 14, p. 200, 208; June 28, p. 126; July 26, p. 121; Aug. 23, p. 170; Sept. 6, p. 134, 136, 144, 153; Sept. 20, p. 188; Oct. 4, p. 154; Oct. 18, p. 189; Nov. 15, p. 141; Nov. 29, p. 177  
 Powder metallurgy, Jan. 26, p. 108; Mar. 8, p. 113; May 17, p. 123; July 26, p. 5  
 Power plant equipment, Apr. 19, p. 212; May 17, p. 154; Aug. 23, p. 248; Sept. 6, p. 176; Oct. 18, p. 222; Nov. 15, p. 187  
 Power supplies, dc, subminiature, Aug. 23, p. 170  
   transistorized, Mar. 8, p. 148  
 Performing and welding, Apr. 19, p. 148  
 Press brakes, Apr. 5, p. 96





- Pressure losses in hydraulic lines, Oct. 4, p. 113  
 pickup, Sept. 20, p. 204  
 transmitter, Aug. 23, p. 204  
 Printed circuits, Apr. 19, p. 12, 122; May 3, p. 5  
 Printer, magnetic, May 17, p. 6  
 Processing, Jan. 12, p. 202; Feb. 9, p. 188; Mar. 8, p. 182; Mar. 22, p. 212; Apr. 19, p. 214; May 17, p. 15, 152; June 14, p. 256  
 equipment, Feb. 23, p. 196; May 3, p. 202; May 31, p. 190; July 12, p. 204; Aug. 9, p. 165; Sept. 6, p. 178; Sept. 20, p. 228; Oct. 4, p. 99, 172; Oct. 18, p. 223; Nov. 1, p. 147; Nov. 15, p. 189; Nov. 29, p. 191; Dec. 13, p. 213  
 Product development, Jan. 26, p. 56  
 improvement, Oct. 18, p. 148  
 Products, profitable, Feb. 9, p. 80  
 Projector, automatic, Jan. 12, p. 130  
 Protecting design ideas, Mar. 8, p. 92  
 Protector, pressure-gage, Oct. 18, p. 157  
 Prototype appearance models, Mar. 8, p. 118  
 Pulleys (see also sheaves)  
 Pumps, Jan. 12, p. 162, 170, 182; Jan. 26, p. 152; Feb. 9, p. 88; Feb. 23, p. 168; Mar. 8, p. 186; Mar. 22, p. 216; May 3, p. 208; May 17, p. 160; May 31, p. 194; July 26, p. 6, 136, 138; Aug. 9, p. 150; Aug. 23, p. 174, 196; Sept. 6, p. 182; Sept. 20, p. 178, 244; Nov. 1, p. 148; Nov. 29, p. 166, 177, 198; Dec. 13, p. 174, 234; Dec. 27, p. 120  
 control volume, Oct. 4, p. 83  
 hydraulic, July 12, p. 117, 152  
 pneumatic, July 12, p. 168
- R**
- Radar beacon, July 26, p. 6  
 Radar speed meter, Oct. 18, p. 6  
 Radio, automatic warning, Nov. 1, p. 14  
 paging system, Feb. 23, p. 6  
 two-way lightweight, Sept. 6, p. 22  
 interference reduction, Sept. 6, p. 124  
 Rail coach, lightweight, Sept. 6, p. 10  
 Railroad train, double-ended, Dec. 27, p. 14  
 Recorders, May 17, p. 146; Sept. 6, p. 5; Dec. 13, p. 202  
 graphic, May 3, p. 176  
 tape, miniature, Aug. 9, p. 14  
 Rectifiers, Feb. 9, p. 163; Mar. 8, p. 144; Mar. 22, p. 156; May 17, p. 110; June 14, p. 22; July 12, p. 178; Aug. 23, p. 199; Nov. 1, p. 134; Nov. 15, p. 143; Nov. 29, p. 156  
 germanium, Jan. 26, p. 71  
 Reducers, speed, Mar. 8, p. 138; Mar. 22, p. 171, 172; Apr. 19, p. 179; May 3, p. 162; May 17, p. 123; June 28, p. 65, 112; July 12, p. 148; Aug. 9, p. 148; Aug. 23, p. 184; Nov. 15, p. 143, 156; Dec. 13, p. 166, 168  
 Regulators, flow, Feb. 23, p. 94; June 28, p. 110  
 pressure, Feb. 23, p. 156, 170; Dec. 13, p. 162, 191, 232  
 vacuum, Mar. 8, p. 145  
 voltage, May 3, p. 12; May 17, p. 85; June 14, p. 99  
 Relays, Jan. 12, p. 164; Jan. 26, p. 120, 130; Mar. 8, p. 158; Mar. 22, p. 176; Apr. 5, p. 144; Apr. 19, p. 188; May 3, p. 155; June 14, p. 190, 211; June 28, p. 64, 120; July 12, p. 150, 166, 172; Aug. 9, p. 132; Sept. 6, p. 152; Oct. 4, p. 152; Oct. 18, p. 163, 173; Nov. 15, p. 141, 150, 171; Dec. 27, p. 104  
 Remote handling equipment, Nov. 15, p. 15  
 Report writing, simplified, Jan. 26, p. 90  
 Research and development, Jan. 26, p. 56, 132, 136; Feb. 23, p. 142; Mar. 22, p. 192; May 17, p. 12; May 31, p. 176; Aug. 9, p. 5, 10; Oct. 4, p. 164, 165; Nov. 29, p. 5  
 Resistors, May 31, p. 175; Aug. 9, p. 130; Aug. 23, p. 181; Nov. 1, p. 132  
 Retaining ring assemblies, Dec. 27, p. 67  
 Rheostats, Apr. 5, p. 164; Apr. 19, p. 176; Nov. 29, p. 164  
 Rivet process, extruded, June 28, p. 63  
 Rolling, thread and form, Jan. 26, p. 101  
 Rolling-contact mechanisms, July 26, p. 75  
 Rotational-stop mechanism, Dec. 27, p. 119  
 Rotor, external, Feb. 23, p. 93  
 Rotors, permanent magnet, May 3, p. 122  
 Rubber, Jan. 26, p. 62; Apr. 19, p. 128; May 17, p. 138; July 12, p. 6, 126, 166, 178; Sept. 20, p. 150; Oct. 4, p. 14, 125; Nov. 15, p. 156; Dec. 13, p. 168; Dec. 27, p. 108  
 tire fuel tank, Feb. 23, p. 12
- S**
- Safety, factors of, July 12, p. 76  
 Satellite, earth, Nov. 1, p. 82  
 Saturable reactors, Oct. 4, p. 136  
 Scientists and engineers, Aug. 23, p. 160  
 Screws, power, Aug. 23, p. 94; Sept. 6, p. 81, 180; Nov. 29, p. 106  
 Seals, Feb. 23, p. 202; Apr. 19, p. 216, 218; May 3, p. 208; June 14, p. 193; June 28, p. 64, 112, 120; Sept. 20, p. 181, 196; Oct. 4, p. 146; Oct. 18, p. 14; Nov. 1, p. 140; Dec. 13, p. 162  
 closure, Sept. 6, p. 97  
 mechanical, Jan. 12, p. 162, 167, 203; Feb. 23, p. 200; Mar. 22, p. 218; Apr. 5, p. 198, 200; Apr. 19, p. 216; June 14, p. 190, 262; June 28, p. 144; July 26, p. 138; Aug. 23, p. 260; Sept. 6, p. 180; Sept. 20, p. 175; Oct. 4, p. 174; Oct. 18, p. 238; Dec. 13, p. 236; Dec. 27, p. 119  
 Servos, Jan. 12, p. 162; Apr. 5, p. 160; May 3, p. 174; May 31, p. 5; June 28, p. 74; July 26, p. 78; Aug. 9, p. 106; Aug. 23, p. 172; Nov. 29, p. 114; Dec. 13, p. 133; Dec. 27, p. 73  
 amplifiers, Apr. 5, p. 148  
 systems, analyzing, Nov. 1, p. 87  
 Shaft extensions, Nov. 1, p. 138  
 positioning, Apr. 5, p. 196  
 suspension, magnetic, June 14, p. 260  
 Shafts, flexible, Jan. 26, p. 62; July 12, p. 170  
 stepped and tapered, deflections of, Aug. 9, p. 111  
 Shearing moving webs, May 3, p. 101  
 Sheaves, May 31, p. 194; Dec. 27, p. 109  
 Ships, nuclear powered, Nov. 29, p. 23  
 Silicones, Apr. 5, p. 146; May 17, p. 138; Dec. 13, p. 168  
 Silver and alloys, Sept. 6, p. 15  
 Simulators, analog, Aug. 9, p. 86  
 Slide rule, Mar. 22, p. 192  
 Solar energy, Oct. 4, p. 5  
 Soldered joints, June 14, p. 123  
 Soldering, May 17, p. 10  
 Solenoids, Apr. 5, p. 144; Apr. 19, p. 160; July 26, p. 112; Sept. 6, p. 140; Dec. 13, p. 182  
 ac push-pull, July 26, p. 100  
 Speedometers, Apr. 19, p. 15  
 Spindles, Apr. 5, p. 146  
 Springs, Mar. 8, p. 152; Apr. 19, p. 133; June 14, p. 131; June 28, p. 6; July 26, p. 110; Oct. 18, p. 192  
 air, May 3, p. 22  
 alloys, May 31, p. 121  
 Sprockets, May 3, p. 206; May 17, p. 128  
 Stabilizers, ship, Apr. 19, p. 22  
 Stacked assembly of electronic components, Oct. 18, p. 96  
 Stampings, Aug. 9, p. 98  
 metal, strengthening, Nov. 1, p. 104  
 Standards, drafting, July 12, p. 5  
 NEMA, for motors, July 12, p. 121  
 for guided missiles, Jan. 26, p. 14  
 Starters, motor, Jan. 12, p. 178; Apr. 19, p. 182  
 Steel, Jan. 26, p. 10; Mar. 8, p. 160; May 3, p. 96; Nov. 15, p. 128, 162  
 stainless, Oct. 18, p. 114  
 Steering, power, for tractor, July 12, p. 96  
 Stop mechanism, rotational, Aug. 9, p. 168  
 Strain gages, Apr. 5, p. 171  
 Stress analysis, Jan. 12, p. 119; Mar. 8, p. 115; May 17, p. 103, 112  
 Studs, mounting, Oct. 18, p. 178  
 Suspension joint for automobiles, June 14, p. 14  
 Switch engine, rubber-tired, Apr. 19, p. 118  
 Switchboard, transistor-equipped, May 31, p. 15  
 Switches, Jan. 12, p. 164, 168, 172; Feb. 9, p. 145; Feb. 23, p. 156, 160, 202; Mar. 8, p. 148, 154, 164; Mar. 22, p. 99, 168, 184; Apr. 5, p. 160; Apr. 19, p. 174, 186; May 3, p. 22, 139, 162, 164; May 31, p. 83; June 28, p. 110; July 12, p. 150, 159; July 26, p. 110, 115; Aug. 23, p. 170, 206; Sept. 6, p. 142; Sept. 20, p. 158, 170, 175, 193, 196; Oct. 4, p. 150, 160; Oct. 18, p. 157, 163; Nov. 1, p. 127, 133, 135; Nov. 15, p. 152, 160; Dec. 13, p. 160, 184; Dec. 27, p. 104, 108



limit, Oct. 4, p. 138  
 pressure, Jan. 26, p. 118; May 3, p. 168  
 Swivel joints, Feb. 9, p. 142; May 17, p. 124; Sept. 6, p. 154, 162; Nov. 1, p. 128  
 Systems engineering, Nov. 1, p. 120  
 hydraulic, Feb. 23, p. 108; Aug. 9, p. 121; Nov. 15, p. 107; Dec. 13, p. 133

## T

Tachometers, May 17, p. 138; July 12, p. 159; Sept. 6, p. 134, 164; Sept. 20, p. 112, 172, 190; Oct. 18, p. 157, 178; Nov. 1, p. 129; Dec. 27, p. 62  
 Tags, identification, Feb. 9, p. 8  
 Tanker, reactor-powered, Oct. 18, p. 14  
 Tap-drill sizes, May 31, p. 98  
 Tape, Mar. 8, p. 137; Oct. 18, p. 248  
 insulating, May 31, p. 159  
 Tapped holes, blind, July 26, p. 99  
 Tapping screws, June 28, p. 97  
 Television camera for internal inspection, Sept. 20, p. 10  
 industrial, July 12, p. 8  
 portable, Mar. 22, p. 6  
 Temperature probe, Oct. 18, p. 200  
 manufacturing, specifying, Aug. 9, p. 91  
 Tension control, automatic, Mar. 8, p. 184  
 Terminals, Apr. 5, p. 146; Oct. 18, p. 167; Nov. 15, p. 168; Dec. 13, p. 172  
 Testing, Jan. 26, p. 95, 136, 146; Feb. 23, p. 142, 181, 198; Mar. 8, p. 15, 182; Apr. 5, p. 12, 194; May 3, p. 204; May 17, p. 10; May 31, p. 190; June 14, p. 258; July 12, p. 207; July 26, p. 135; Aug. 9, p. 15; Aug. 23, p. 214, 250; Sept. 6, p. 164; Sept. 20, p. 24, 230; Nov. 15, p. 162; Nov. 29, p. 105, 192; Dec. 13, p. 217  
 electronic equipment, Sept. 6, p. 115  
 gears, July 26, p. 95  
 vibration, Mar. 22, p. 100  
 Thermometers, Mar. 8, p. 167; July 12, p. 184; Nov. 29, p. 180  
 Thermostats, Jan. 12, p. 184; Apr. 5, p. 146; Apr. 19, p. 68; May 31, p. 166; July 12, p. 152; Aug. 23, p. 170; Sept. 20, p. 188; Nov. 15, p. 178; Nov. 29, 159; Dec. 27, p. 108  
 Thread, interference fit, Sept. 6, p. 83  
 rolling machine, Apr. 19, p. 117  
 Tie rods, June 14, p. 217  
 Timers, Jan. 12, p. 164, 183; Jan. 26, p. 120; Feb. 9, p. 170; Mar. 8, p. 26; May 3, p. 160; May 17, p. 120; June 28, p. 122; July 12, p. 162; July 26, p. 124; Aug. 23, p. 14, 176; Sept. 6, p. 152; Oct. 18, p. 176; Nov. 15, p. 150; Nov. 29, p. 172; Dec. 27, p. 106, 108  
 Tips and techniques, June 14, p. 109, 130; June 28, p. 62, 69; July 12, p. 81, 93, 102, 115; July 26, p. 74, 84, 91; Aug. 9, p. 80, 90, 98; Aug. 23, p. 104, 144, 148; Sept. 6, p. 113, 114, 118; Sept. 20, p. 104, 111, 120; Oct. 4, p. 82, 95, 98, 112; Oct. 18, p. 106, 113, 134, 138; Nov. 1, p. 79, 91, 112; Nov. 15, p. 82, 106, 115; Nov. 29, p. 85, 118, 138; Dec. 13, p. 99, 115, 136; Dec. 27, p. 60, 66, 76, 85  
 Tires, oversize, for airplanes, June 14, p. 24  
 Titanium & alloys, Jan. 26, p. 75; Apr. 5, p. 134; Aug. 23, p. 153, 199  
 Torch, gas, July 12, p. 10  
 Torque control, Mar. 22, p. 156; Nov. 29, p. 119  
 converters, hydraulic, Apr. 5, p. 126, 144; May 3, p. 158; July 26, p. 136  
 motor, Apr. 19, p. 163  
 Trail markers, electronic, Sept. 20, p. 6  
 Train, lightweight, Mar. 8, p. 5  
 Training design engineers, Oct. 18, p. 92  
 Transducers, July 12, p. 184  
 accurate positioning, Nov. 15, p. 83  
 force, Oct. 18, p. 197  
 pressure, Feb. 23, p. 158; Mar. 22, p. 156  
 Transformers, Feb. 23, p. 152; Nov. 15, p. 180; Nov. 29, p. 182  
 Transistors, Jan. 12, p. 176; Jan. 26, p. 6; Feb. 23, p. 5; Mar. 8, p. 160; Apr. 19, p. 8; Dec. 13, p. 186  
 Translator, mechanical, Nov. 15, p. 22  
 Transmissions, adjustable speed, July 12, p. 156; Aug. 23, p. 194, 202; Sept. 20, p. 158; Nov. 15, p. 190; Dec. 27, p. 61  
 variable speed, Feb. 9, p. 6, 145; Feb. 23, p. 200; Mar. 22, p. 178; Apr. 5, p. 126, 166; May 17, p. 120, 126, 142; May 31, p. 154, 192; June 14, p. 100, 185, 214

Truck, small, four-wheel drive, Dec. 13, p. 5  
 Tube cooling inserts, Feb. 9, p. 154  
 Tubes, rectangular and elliptical, section factors for, Oct. 18, 139  
 round, bending, Sept. 20, p. 141  
 Tubing, Feb. 23, p. 180; Mar. 8, p. 115; Apr. 19, p. 179; July 12, p. 164; Aug. 9, p. 130  
 Turbines, gas, for automobile, Mar. 8, p. 12  
 gas, for helicopter, Mar. 8, p. 8; June 14, p. 8  
 gas, small, Feb. 9, p. 133  
 steam, Nov. 15, p. 6  
 Turnbuckles, Nov. 15, p. 165  
 Typewriter, electronic, Nov. 1, p. 10  
 word and phrase, Mar. 22, p. 8  
 type, interchangeable, Mar. 22, p. 14

## U, V

Ultrasonic energy generator, Nov. 1, p. 5  
 Undercutting gear teeth, Apr. 19, p. 123  
 Union, engineer's May 31, p. 24  
 Universal joints, May 17, p. 160; Sept. 6, p. 142; Nov. 15, p. 160  
 Valves, Jan. 12, p. 167, 174, 182; Jan. 26, p. 118; Feb. 9, p. 150; Feb. 23, p. 177; Mar. 8, p. 156; Mar. 22, p. 99, 183, 187; Apr. 5, p. 154; Apr. 19, p. 100, 163, 168, 170, 134, 142; Aug. 23, p. 176, 188; Sept. 6, p. 134, 156; p. 110, 130, 142; July 12, p. 156, 210; Aug. 9, p. 132, 134, 142; Aug. 23, p. 176, 188; Sept. 6, p. 134, 156; Sept. 20, p. 158, 166, 178; Oct. 4, p. 148; Oct. 18, p. 98, 167, 180; Nov. 1, p. 132, 150; Nov. 15, p. 141, 150, 155; Dec. 13, p. 160, 164, 177; Dec. 27, p. 108, 120  
 check, May 17, p. 132  
 hydraulic, Jan. 26, p. 61, 120, 124, 127; Feb. 23, p. 152; Mar. 8, p. 150; Apr. 5, p. 162, 198; May 3, p. 208; May 17, p. 120; June 28, p. 128, 144; July 12, p. 208; Sept. 6, p. 138; Nov. 1, p. 135; Dec. 27, p. 104  
 lubrication, Dec. 13, p. 101  
 measuring, June 14, p. 27  
 mixing, Sept. 6, p. 148  
 pneumatic, Jan. 26, p. 120, 127, 154; Mar. 22, p. 155; May 31, p. 156, 169, 174; July 26, p. 112, 115; Aug. 23, p. 181; Nov. 1, p. 127  
 Van, freight, for rails and roads, May 31, p. 14  
 Varistor, discharge, Nov. 1, p. 139  
 Vernier dials, July 26, p. 120  
 Vibration absorbers, dynamics, Sept. 20, p. 134  
 cam, minimizing, Aug. 9, p. 103  
 control in welded structures, July 12, p. 103  
 damper, Aug. 9, p. 168  
 damper, power, Aug. 9, p. 93  
 damper, torsional, Sept. 20, p. 246; Nov. 29, p. 198  
 detector, June 14, p. 193  
 meter, May 3, p. 176  
 testing, Mar. 22, p. 100  
 Vibrators, electromagnetic, May 17, p. 67  
 Vibrometer, Oct. 4, p. 164  
 Voltage stabilizer, Nov. 1, p. 127  
 Voltmeter, Jan. 12, p. 136; June 28, p. 134

## W, X, Z

Washers, July 12, p. 144; Aug. 23, p. 135  
 lock, Aug. 23, p. 135; Sept. 20, p. 246  
 Way protector, May 3, p. 155  
 Weapons, new U. S., Nov. 15, p. 5  
 Wear evaluation, Jan. 12, p. 101  
 resistant materials, May 31, p. 126  
 Weighing, May 3, p. 178  
 moving vehicles, Mar. 22, p. 10  
 Welding, Apr. 5, p. 97; Apr. 19, p. 103, 158; May 3, p. 96  
 applied liners, July 26, p. 86  
 Winding, plastic encased, Apr. 19, p. 101  
 Wipers, way, Sept. 20, p. 186  
 Wire and wire products, Feb. 9, p. 111; Aug. 23, p. 199  
 Wire baskets made automatically, Dec. 13, p. 128  
 holder, Nov. 29, p. 196  
 Wiring, electric, July 26, p. 92  
 hardness, Jan. 12, p. 176  
 Writing, technical, Apr. 5, p. 111  
 X-ray panoramic, Mar. 8, p. 5  
 Zirconium, Mar. 8, p. 122



